Do femoral nerve blocks improve acute pain control in adults with isolated hip fractures?

Articles chosen

Clinical bottom line
Femoral nerve blocks provide faster pain relief than systemic analgesia and decrease opiate requirements. This technique can be performed by physicians in the emergency department (ED).

Literature search

Limits: All adult: 19+ years, human
Yield: 27 results

Studies that used other types of nerve blocks such as subcostal, lateral cutaneous and psoas blocks were excluded. A 2004 Cochrane Review update,1 “Nerve blocks (subcostal, lateral cutaneous, femoral, triple, psoas) for hip fractures,” was excluded for this reason as well, although the references were examined for relevant articles. Studies that described the use of nerve blocks in the operative and postoperative settings were excluded for probable lack of generalizability to the emergency setting.

The evidence

Design
Prospective, randomized controlled trials each conducted in a single UK hospital ED.

Fletcher and colleagues recruited consecutive patients over a 6-month period. Patients were randomized using a random number generator, concealing allocation using a sealed opaque envelope. Patients were not blinded as to their treatment. Admitting staff surgeons, nurses and the data abstractor were blinded to treatment allocation.

Haddad and Williams recruited 50 consecutive patients who presented to the ED with extracapsular femoral fractures and used sealed envelopes to conceal the random allocation to treatment. The randomization method was not specified, nor was envelope opacity. Patients were not blinded as to treatment allocation. The authors did not specify whether the assessing clinician was blinded, although admitting surgeons and nursing staff were not aware of patient treatment in the ED.

Population
Fifty adult patients with femoral neck fractures (Article 1; Fletcher and colleagues) and 50 adult patients with extracapsular femoral fractures (Article 2; Haddad and Williams). Fractures were confirmed radiographically. Patients with dementia or confusion were excluded from the study analysis. The Fletcher group also excluded patients with a bleeding diathesis, patients on anticoagulants, those with local or systemic infection and those with hypersensitivity to local anesthetics.

Intervention
Fletcher and colleagues randomized patients to either 3-in-
A 3-in-1 nerve block described in Fletcher and colleagues’ study is a technique whereby local anesthetic is applied to the femoral nerve of the thigh and the lower cords of the lumbar plexus. The block was inserted 1 cm lateral to the femoral pulse, using the presence of paresthesias to confirm location. The injection was inserted in a cranial direction with the application of pressure immediately distal to the injection site to prevent distal tracking. Although ultrasound guidance has been suggested by some to improve the success rate of this block, all members of this ED successfully applied the technique after a 30-minute training session using a mannequin, followed by witnessed patient injections. Haddad and Williams’ results are less generalizable because Haddad performed all blocks himself.

The minimum clinically important difference in a 10-cm VAS is 9–13 mm. This was achieved in Haddad and Williams’ nerve-block group at 15 min and 2 h. Although the Fletcher group reported mean pain scores in the pre-block groups, they did not provide data on post-block pain scores. Time to maximal pain relief in both nerve-block groups was greater than 2 h and longer in the control groups, suggesting that neither group had adequate paracutaneous analgesia. Additionally, given the expected onset of analgesia with an effective nerve block, incomplete pain relief may reflect inappropriate use of the technique (e.g., in intracapsular fractures), incomplete nerve block due to poor technique, or partial pain mediation by other nerves. Because of the latter concern, some experts recommend other nerve blocks (i.e., subcostal, lateral femoral cutaneous, femoral and psoas) to reduce hip fracture pain.

Because the patients in these studies were not blinded (it was felt that a placebo injection would be ethically unacceptable), the placebo effect cannot be quantified. Additionally, in the absence of blinding, patients could have revealed their allocation group to their assessors, further biasing the results.

The number needed to treat cannot be calculated from the data provided in these articles.

Comments

A variety of nerve blocks have been shown to reduce the need for postoperative systemic analgesia in hip fractures. The 3-in-1 nerve block described in Fletcher and colleagues’ study is a technique whereby local anesthetic tracks along the femoral sheath to anesthetize not only the femoral nerve but also the obturator, lateral femoral cutaneous nerve of the thigh and the lower cords of the lumbar plexus. The block was inserted 1 cm lateral to the femoral pulse, using the presence of paresthesias to confirm location. The injection was inserted in a cranial direction with the application of pressure immediately distal to the injection site to prevent distal tracking. Although ultrasound guidance has been suggested by some to improve the success rate of this block, all members of this ED successfully applied the technique after a 30-minute training session using a mannequin, followed by witnessed patient injections. Haddad and Williams’ results are less generalizable because Haddad performed all blocks himself.

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Because the patients in these studies were not blinded (it was felt that a placebo injection would be ethically unacceptable), the placebo effect cannot be quantified. Additionally, in the absence of blinding, patients could have revealed their allocation group to their assessors, further biasing the results.
No patient in either study suffered adverse consequences as a result of the nerve block, although the nerve block for 1 patient was unsuccessful. Reported complications include intravascular injection of anesthetic, infection, masking of compartment syndrome, nerve damage and prolonged motor blockade.

Although evidence for the use of femoral nerve blocks in the ED is limited, these studies support the hypothesis that use of the femoral nerve block provides better early analgesia in adult patients with hip fractures. More aggressive systemic analgesia may be able to achieve the same end-point with the inherent risks carried by increased opiate use such as respiratory depression. Both studies cite a reduced need for systemic analgesia in femoral nerve block. However, it is not known whether this end-point alone is clinically significant in terms of patient outcomes.

Acknowledgements: I acknowledge my EBM role models, whose teaching inspired this Journal Club article: Stacy Ackroyd, Dr. John Tallon, Dr. Kirk Magee, Tim Ruggles and Dr. James Ducharme.

Competing interests: None declared.

Key words: hip fracture; analgesia

References


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